

# PATENT ABSTRACTS OF JAPAN

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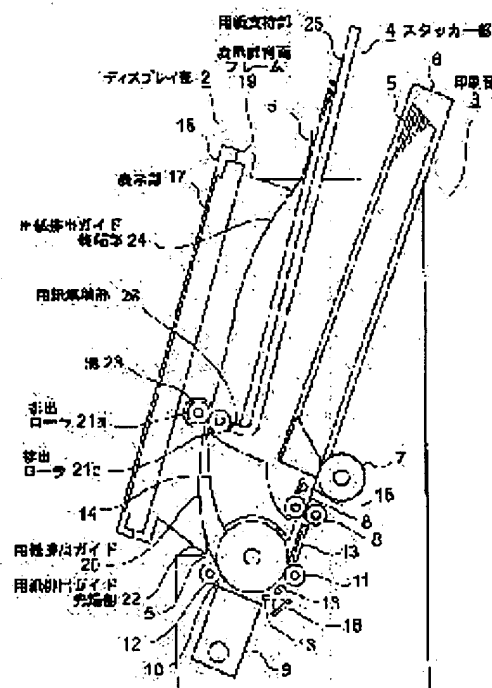
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## (54) DISPLAY WITH PRINTER

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To mount a printing part in a close contact state to a display part and provide a display with a printer of a small installation area by utilizing a rear face of the display part as a paper delivery guide of the printing part.

**SOLUTION:** A printing part 3 is set to the back of a display part 2 having a display part 17 and a display part rear frame 19 for covering a rear face of the display part. A paper delivery guide 20 for guiding a paper transferred after printed from the printing part 3 is set to the display part rear frame 19.



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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the display with a printer which equipped with the printer the display which are displays, such as a personal computer and a word processor.

[0002]

[Description of the Prior Art]When a personal computer, a word processor, etc. were used as a personal youth, the printer which is the display and output unit which are displays was installed on an individual's desk in many cases, and a big area for installation was needed. Therefore, these days, the product which miniaturized these displays and a printer is developed, especially about a display, the thing of the conventional cathode-ray tube is replaced and the display of a flat form using a liquid crystal display panel with little depth or a PDP display panel is beginning to spread.

[0003]

[Problem(s) to be Solved by the Invention]However, even if it was a display of the flat form, in order to hold a display screen in predetermined height, the leg is provided towards the desk top from the center section of the back of a display screen, and useless space had occurred between the right and left of this leg and the frame of a display screen, and the desk surface. Since it compared with the display and arranged when installing on a desk, although the size itself is also becoming the printer of an output unit small, both needed each installation area and the big installation area was required like before.

[0004]

[Means for Solving the Problem]As a means to solve the above technical problem, a display with a printer of this invention, It has a printing department which prints behind a display with a wrap frame for regions of back of an indicator and an indicator while carrying out feed conveyance of the paper, and has a paper discharge guide means to guide a paper conveyed by frame from a printing department to an eject direction.

[0005]

[Embodiment of the Invention]A drawing is explained to reference for this embodiment of the invention below.

(A 1st embodiment) The composition of the display with a printer of a 1st embodiment is explained. Drawing 1 is an appearance perspective view showing the display with a printer of a 1st embodiment of this invention (it is henceforth described as a display).

[0006]The display 1 is provided with the following in drawing 1.

Display part 2.

The printing department 3 arranged to the back side of the display part 2.

The stacker part 4 which accumulates and supports the print sheet discharged after printing.

[0007]Drawing 2 is a sectional view explaining the composition of the display of a 1st embodiment of

this invention, and looks at what cut mostly perpendicularly the display 1 expressed with the appearance perspective view of drawing 1 in the center from right-hand side.

[0008]Drawing 2 is provided with the following.

The paper cassette 6 which stored the paper 5 in the printing department 3, and has been arranged almost in parallel with the display screen of the display part 2.

The feed roller 7 which feeds paper to the paper 5 from the paper cassette 6.

The resist roller 8 which the tip of the paper 5 to which paper was fed is aligned, and is conveyed.

The platen 10 and the pinch roller 11 which convey the paper which aligned with the resist roller 8 to the print head section 9, and the feed roller 12 which conveys the paper 5 printed by the print head section 9 with the platen 10 to the display part 2.

Furthermore, the printing department 3 is equipped with the feeding guide 13 which guides the paper 5 conveyed with the above-mentioned rollers to the print head section 9, the conveyance guide 14 which guides the paper after printing, and the paper detection sensors 15 and 16 which detect whether the paper 5 is conveyed normally. The printing department 3 with the paper carrying means and the above-mentioned sheet guide of the above-mentioned rollers. Feed conveyance of the paper 5 was carried out towards the anterior part lower part from the upper rear part of the device, after printing by the print head section 9 arranged in the anterior part lower part of a device, a paper is turned to the upper rear part of a device, and is conveyed, and the paper carrying path of approximately J type is adopted. The print head section 9 which prints toward the slanting upper part from the outside at the pars basilaris ossis occipitalis of the paper carrying path of this approximately J type is arranged. By having arranged the paper carrying path and the print head section 9 of these J type in the lower part of device anterior part, the space of the lower part of the display part 2 is used further effectively, without enlarging depth of a device. In a 1st embodiment, the thermal print head which carries an ink ribbon can be used for the print head section 9.

[0009]The display part 2 is equipped [ the periphery of the indicator 17 provided with the driver part which emits light in a liquid crystal display panel and a liquid crystal display panel, and the indicator 17 ] with the wrap indicator back frame 19 for the wrap indicator front frame 18 and the back of the indicator 17. The paper discharge guide 20 which guides the paper 5 after printing to the indicator back frame 19 in an eject direction, The discharge roller pairs 21a and 21b which rotate while pressing mutually, in order to discharge the paper which has been arranged on the paper discharge guide 20 and conveyed along with the paper discharge guide 20 out of the printing department 3, It has the stacker part 4 which accumulates the paper which has been arranged almost in parallel with the indicator 17, and was conveyed by the discharge roller pairs 21a and 21b.

[0010]Next, the shape of the paper discharge guide 20 is explained. The paper discharge guide tip part 22 which guides first the paper conveyed from the printing department 3 is arranged below this tangent so that conveyance of the paper 5 may not be prevented from the printing department 3 to the paper 5 conveyed toward the tangential direction of the platen 10 and the feed roller 12. The shape of the paper discharge guide 20 from the paper discharge guide tip part 22 to the discharge roller pairs 21a and 21b, Gradually the paper 5 conveyed in the tangential direction of the platen 10 and the feed roller 12 with a derrick down to the stacker part 4 side The discharge roller pair 21a, The paper carrying path which is incurvated so that it may be connected with the tangent of 21b, and is formed with the conveyance guide 14 of the printing department 3 is narrowed as the sandwiching part of the discharge roller pairs 21a and 21b is approached. The position of the discharge roller pairs 21a and 21b arranged on the paper discharge guide 20, When the paper of the shortest length used by the printing department 3 is conveyed along with the paper discharge guide 20, before the termination of the paper of the shortest length separates from the sandwiching part of the platen 10 and the feed roller 12, it arranges in the position which can pinch a tip. the slot 23 where the discharge roller 21a was formed in the indicator back frame 19 -- a roller surface -- the paper discharge guide 20 -- \*\* -- it elutriates in fixed quantity and is stored. The shape of the paper discharge guide 20 from the discharge roller 21a to the paper discharge guide trailer 24 which

is a termination of the paper discharge guide 20, After extending to the tangential direction of the discharge roller 19, it is curving gently-sloping so that the paper supporter 25 of the stacker part 4 arranged almost in parallel with the indicator 17 of the display part 2 may be approached.

[0011]The stacker part 4 is provided with the form gathering part 26 provided with the field bent almost right-angled to the paper supporter 25 in the paper supporter 25 and the lower end part of the paper supporter 25. The paper supporter 25 is arranged almost in parallel with an indicator as above-mentioned, and it supports the paper 5 discharged from the discharge roller pairs 21a and 21b while it guides the paper 5 under conveyance by the discharge roller pairs 21a and 21b.

Although the form gathering part 26 accumulates the termination of the paper 5 discharged from the discharge roller pairs 21a and 21b, It in order for the arrangement to prevent the paper discharged from the discharge roller pairs 21a and 21b continuing riding on a discharge roller side. The discharge roller pair 21a, It is lower than the upper surface of 21b, and in order to prevent the termination of the accumulated paper 5 from being again involved in the discharge roller pairs 21a and 21b, it is considered as the position higher than the line which connects each center of rotation of the discharge roller pairs 21a and 21b.

[0012]The paper 5 conveyed by the platen 10 and the feed roller 12 of the printing department 3, If the termination of the paper 5 separates from the discharge roller pairs 21a and 21b, being guided to the paper discharge guide 20 which was explained above after being conveyed up by the discharge roller pairs 21a and 21b along with the paper supporter 25 of the stacker part 4, the form gathering part 26 will be fallen and piled up.

[0013]Drawing 3 is a perspective view explaining the back of the display part 2 of the display of a 1st embodiment of this invention.

[0014]The paper discharge guide 20 provided in the indicator back frame 19 of the back of the display part 2 in drawing 3 is coating \*\*\*\* with a fluoro-resin about the surface while making all edge parts into a curved surface so that the end of a presser-foot paper may not be low caught in friction with the paper discharged. In the position explained by drawing 2 on the paper delivery guide 20. The follower side discharge roller shaft 27 provided with the discharge roller 21a and the driving-side discharge roller shaft 28 provided with the discharge roller 21b by the bearing 30 fixed to the discharge roller shaft supporting part 29 fixed to the indicator back frame 19, and the discharge roller shaft supporting part 29. It is supported by physical relationship which is rotated while the discharge roller pairs 21a and 21b press mutually. The driving-side discharge roller shaft 28 has extended the shaft part of both ends from the discharge roller shaft supporting part 29 to the outside direction, and has equipped with the belt pulley 31 for acquiring a drive via the driving source and belt which are not illustrated to one side. The discharge roller shaft supporter 29 is provided with the buck 32 for supporting the form gathering part 26 of the stacker part 4, and the engagement hole 33 for fixing the stacker part 4. 34 is an electrical link code for connecting the indicator 17 of drawing 2, and the power supply section which provided in the printing department 3.

[0015]The form gathering part 26 of the stacker part 4 is the uneven shape which escaped from the discharge roller 21b. The rear face of the paper supporter 25 of the stacker part 4 is equipped with the engaging pawl 35 for engaging with the engagement hole 33 of the discharge roller shaft supporting part 29, and fixing the stacker part 4 to the display part 2.

[0016]Drawing 4 is an important section perspective view explaining the composition for equipping the printing department 3 with the display part 2 of the display of a 1st embodiment of this invention. wearing to the printing department 3 of the display part 2 -- right and left -- on the other hand, drawing 4 shows only an end for the same gestalt.

[0017]In drawing 4, 36 is joint which combines the display part 2 and the printing department 3. The display frame fixed supporting part 37 to which the joint 36 carries out fixing support of the indicator frame 18 and the indicator back frame 19 of the display part 2, It has the boss section 40 which inserts in the notch section 39 provided in the position of the chassis 38 of the printing department 3, and carries out rotation support of the joint 36. The key groove 42 which inserts each other in

the display frame fixed supporting part 37 of the joint 36 with the key part 41 provided in the indicator frame 18 and the indicator back frame 19, and fixes the display part 2 is formed. The two stoppers 43 are formed in the circumference section of the boss section 40 at intervals of the angle  $\alpha$ . This angle  $\alpha$  is set up at the angle applied about 10 degrees to the angle  $\beta$  which specifies the notching range of the notch 39 of the chassis 38 in which the boss section 40 is inserted. For example,  $\alpha$  may be 200 degrees when  $\beta$  is formed at 190 degrees. The angle  $\beta$  which specifies the notching range of the notch section 39 is required 181 degrees or more, in order to support the boss section 39, but. Since the driving-side discharge roller shaft 28 is inserted from the opening of the notch section 39, let it be a range which can do the opening more than the shaft diameter of the driving-side discharge roller shaft 28 at least. The angle of inclination of the display part 2 which the display fixed supporting part 37 at the time of the lower part side of the stopper of the edge part by the side of the lower part of the notch section 39 and a boss section hitting holds, The position of the edge part by the side of the lower part of the notch section 39 and the position of the stopper 43 of the boss section 40 are determined so that it may become a relation of the display part 2 and the printing department 3 which were shown by drawing 2. The circumference section of the boss section 40 is coated with resin of high friction material, and the hole 44 formed with the size which supports the driving-side discharge roller shaft 28 enabling free rotation is formed in the axial center.

[0018]After wearing with the display part 2 and the printing department 3 inserts the driving-side discharge roller shaft 28 of the display part 2 in the direction shown by the arrow A of drawing 4 from the front at the opening of the notch section 39 of the chassis 38, While inserting so that the key part 41 of the display part 2 and the own key part 42 may suit the display frame fixed supporting part 37 in the direction which shows the joint 36 by the arrow B from the outside of the chassis 38, The end of the driving-side discharge roller shaft 28 is inserted in the hole 44 of the boss section 40, and the display part 2 is equipped with the printing department 3. In drawing 4, although not illustrated, the driving-side discharge roller shaft 28 equipped the shaft part which penetrated the hole 44 with slip off stop rings, such as an E ring, and has prevented that of a blank from the hole 44 of the joint 36. Although the display part 2 and the printing department 3 are combined by the joint 36 as mentioned above, the two stoppers 43 can rotate the boss section 40 of the joint 36, and the notch section 39 of the printing department 3 at the angle of about 10 degrees of the range in contact with the edge of the notch section 39. Since the circumference section of the boss section 40 of the joint 36 is coated with resin of high friction material, high frictional force arises between the notch sections 39 of the printing department 3, and it is the above-mentioned pivotable range and can hold the display part 2 to a predetermined angle.

[0019]Drawing 5 is a sectional view explaining the discharging operation of the paper 5 at the time of equipping with the display part 2 of the display of a 1st embodiment of this invention at a predetermined angle to the printing department 3, enabling free rotation. Since the paper conveyance operation by the printing department of this device is equivalent to what was explained by drawing 2, it omits explanation.

[0020]In drawing 5, the display part 2 rotates between the position shown with a dashed dotted line, and the positions shown as a solid line focusing on the axial center 45 of the driving-side discharge roller shaft 28, as drawing 4 explained. The position shown with a dashed dotted line is a position explained by drawing 2. The paper 5 printed by the print head section 9 turns to the tangential direction of the platen 10 and the feed roller 12, and is conveyed. The paper discharge guide 20 of the display part 2 rotates to the transportation direction of this paper 5 in the direction of arrow C which estranges the paper discharge guide tip part 22 caudad to the tangential direction of the platen 10 and the feed roller 12. Therefore, the tip of the paper 5 conveyed by the platen 10 feed roller 12 can be conveyed, without checking a paper conveyance route. Furthermore, even if the mutual physical relationship of each members forming which discharges a paper to the display part 2 by having equipped with the discharge roller pairs 21a and 21b and the stacker part 4 which are

paper carrying means rotates the display part 2 to the printing department 3, it does not change. Therefore, paper conveyance capability even if it rotates the display part 2 in the predetermined range to the printing department 3, until it discharges the paper conveyed from a printing department does not decline, and the paper 5, The discharge roller pairs 21a and 21b make [ sandwiching part ] it be the same as for drawing 2 to have explained, being guided with the paper discharge guide 20, and discharge accumulation is carried out by the discharge roller pairs 21a and 21b after that at the stacker part 4. The center of rotation of the display part 2 and the printing department 3 is written with the axial center 45 of the driving-side discharge roller shaft 28 with which the display part 2 was equipped, Even if the distance of the driving source with which the printing department was equipped, and the axial center 45 of the driving-side discharge roller shaft 28 rotates the display part 2 to the printing department 3, it does not need to change, and it does not need to take into consideration the drive transfer route by rotation. In a 1st embodiment, although the rotating range of the display part was made into 10 degrees, this value is set up as a suitable angle to adjust the indicator of a practical display part legible, and this rotating range does not restrict an invention at all.

[0021]Without lowering the discharging capacities of a paper as mentioned above according to a 1st embodiment, It enables it to adjust the angle of the display part 2 by having made the display part 2 pivotable in the predetermined range to the printing department 3, without taking into consideration the channels of communication which transmit the driving force for discharging a paper.

[0022](A 2nd embodiment) The composition of the flat display of a 2nd embodiment is explained.

[0023]The fundamental composition of this device being equivalent to a 1st embodiment, and differing from a 1st embodiment, While dividing a display part into a wrap plate-like indicator frame part and the paper guide frame part provided with the paper discharge guide for the periphery and the back of an indicator, the above-mentioned indicator frame part is having established the transportation device which moves up and down along with a paper guide frame part. Therefore, the numerals same about the same members forming as a 1st embodiment are attached, and explanation is omitted.

[0024]Drawing 6 is a perspective view explaining the back of the display part of the display of a 2nd embodiment of this invention.

[0025]The display part 46 is provided with the following in drawing 6.

It is the wrap indicator frame part 47 about the periphery of the indicator 17 of drawing 2, and regions of back.

The paper guide frame part 48 provided with the paper discharge guide 20.

[0026]The indicator frame part 47 is provided with the following.

Indicator front frame 18.

Indicator back frame 49.

The indicator back frame 49 had the pore 52 to the gear plate 51 which equipped the center section with the two pinion gears 50 which attached the flange at one side, and longitudinal direction both ends, and equips the pore 52 with the indicator stopper 54 which has the engaging pawl 53.

[0027]The paper guide frame part 48 which equips with the indicator frame part 47 on the other hand is provided with the following.

The guide frame 55 which has the paper discharge guide 20.

The T type rack slot 56 which equipped the back of the paper discharge guide 20 of the guide frame 55 with the rack which gears with the pinion gear 50 of the indicator frame part 47, respectively.

The engagement hole 57 which engages with the display stopper's 54 engaging pawl 53 perpendicularly arranged at the predetermined intervals to longitudinal direction both ends.

[0028]Although the rack slot 56 of the paper guide frame part 48 gears and the pinion gear 50 of the indicator frame part 47 moves in the guide frame 55 top of the paper guide frame part 48, the

indicator frame part 47, The bearing of the high friction material made to generate comparatively high frictional force between the gear shafts fixed to the gear plate 51 which is supporting the pinion gear 50 is pressed fit in the pinion gear 50, Therefore, the indicator frame part 47 is prevented from moving rapidly along with the guide frame 55. The pinion gear 50 has prevented the paper guide frame part 48 and the indicator frame part 47 from separating by the flange part and the rack slot 56 on own.

[0029]Drawing 7 and drawing 8 are the sectional views explaining operation of the indicator stopper of the display of a 2nd embodiment of this invention, Drawing 7 and drawing 8 look at what cut the thing on the left-hand side of the display screen stopper 54 perpendicularly to the indicator back frame 49 from the upper part, Drawing 7 shows the state before the display stopper's 54 engaging pawl 53 and the engagement hole 56 of the guide frame 55 are engaged, and drawing 8 shows the state after being engaged.

[0030]While the guidance about the leg 58 is given to the indicator stopper 54 by the side attachment wall 59 and the rib 60 of the indicator back frame 49 in drawing 7 and drawing 8, It is equipped in the state where it was pushed up by the coil spring 63 with which the spring stand 61 and the own indicator stopper spring stand 62 which were established in the indicator front frame 18 were equipped, and was embedded on the indicator frame 48. Therefore, the indicator stopper 54 always has thrust upward in drawing 7 and drawing 8. The spring stand 61 and the display screen stopper spring stand 62 of the indicator front frame part 18 are carrying out cylindrical shape of the path slightly smaller than the inside diameter of a coil spring, The coil spring 63 is held fitting into the spring stand of these cylindrical shape, and it does not separate from it.